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Art Unit: 2111

UPA-01228

REMARKS

In the Office Action, claims 1-6 are rejected under 35 U.S.C. §112 as being indefinite.

In response to the office action, claims 1-6 are now cancelled. New claims 7-13 are presented to particularly point out and distinctly claim the subject matter which applicants regard as the invention in a patentable way to overcome the rejections under 35 U.S.C. §112.

As described in paragraph [0012], instructions of a computer processor can be generally classified into four categories. Three of the four categories require pre-fetching only one instruction because the address of the target instruction succeeding to a current instruction is the program counter plus one, an address contained in the current instruction, or an address popped out from a stack. Only the category of a "conditional branch instruction" requires pre-fetching two instructions with addresses "program counter plus one" or "program counter plus 2". The reason is that the target instruction of the conditional branch instruction can be the instruction at either address. For example, as shown in FIG. 5, the conditional branch instruction "SZ A" pre-fetched during instruction cycle 10 requires pre-fetching two following instructions "JMP 100" and "CALL 200" during instruction cycle 11 because either "JMP 100" or "CALL 200" can be the target instruction which is determined during instruction cycle 11.

The gist of this invention is to provide an architecture and method for fetching

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microprocessor's instructions. The method of this invention pre-fetches and pre-decodes the pre-fetched instruction in a current instruction cycle. If the pre-fetched instruction is determined to be a conditional branch instruction, an instruction reading-amount register is set to a value indicating that two following instructions will have to be pre-fetched in the next instruction cycle. Otherwise, the instruction reading-amount register is set to a value indicating that only one instruction will have to be pre-fetched in the next instruction cycle. As a result, the invention has the advantage that two instructions are fetched only when necessary. The prior art shown in FIG. 2, however, always pre-fetches two following instructions and consumes unnecessary extra power.

The newly presented independent claim 7 has been written to comply with the requirements set forth in 35 U.S.C. §112 to clearly define and claim the subject matter "setting an instruction reading-amount register to a first state if the next instruction pre-decoded is a conditional branch instruction" and "wherein two succeeding instructions after the next instruction are pre-fetched in a next instruction cycle if the instruction reading-amount register is in a first state". The claimed subject matter has not been taught, suggested or anticipated in any of the cited prior arts. Claim 7 should be allowable. By virtue of dependency, new claims 8-9 should also be allowable.

The newly presented independent claim 10 claims the architecture for practicing the method. Similarly to claim 7, it has been written to comply with the requirements set forth in 35 U.S.C. §112. The architecture is novel and non-obvious. None of the cited

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prior arts has disclosed such an architecture. Therefore, claim 10 should be allowable. By virtue of dependency, claims 11-13 should also be allowable.

From the foregoing discussion, it is clear that the instant invention differs from the cited prior arts. The physical difference results in different effects and is not obvious. The newly presented claims 7-13 have overcome the rejection under 35 U.S.C. §112 and should be patentable. The specification has been carefully amended to correct a few editorial and grammatical errors. A few paragraphs are also re-written to improve the readability of the specification. FIGs. 3 and 5-6 are amended to make the description consistent with the specification.

Claims 7-13 are now in full condition for allowance. The attached annotated drawing sheets showing the changes are submitted for approval. Formal replacement drawing sheets will be submitted after the application is allowed. Prompt and favorable reconsideration of the application is respectfully solicited.

Respectfully submitted,



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